

iRobot Corporation TEST REPORT

SCOPE OF WORK

FCC radio and EMC testing for the Sundial radio Module model: AXF-Y1

REPORT NUMBER 104076035BOX-001c

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EMISSIONS TEST REPORT

(Full COMPLIANCE)

Report Number: 104076035BOX-001c Project Number: G104076035

Report Issue Date: 10/03/2019 Report Re-issued Date: 11/04/2019

Model(s) Tested: AXF-Y1 Model(s) Partially Tested: None Model(s) Not Tested but declared equivalent by the client: None

> Standards: CFR47 FCC Part 15.247 Subpart C: 09/2019, CFR47 FCC Part 15 Subpart B: 09/2019, CFR47 FCC Part 1.1310: 09/2019, CFR47 FCC Part 2.1091: 09/2019

Tested by: Intertek Testing Services NA, Inc. 70 Codman Hill Road Boxborough, MA 01719 USA

Report prepared by

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Bedford, MA 01730 USA

Report reviewed by

Kouma Sinn/EMC Staff Engineer

Client:

iRobot Corporation

8 Crosby Dr Mail Stop 12-2

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1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

2 Test Summary

Section	Test full name	Result
3	Client Information	
4	Description of Equipment Under Test and Variant Models	
5	System Setup and Method	
6	Maximum Peak Output Power CFR47 FCC Part 15 Subpart C:09/2019, Section 15.247 (b)(3)	Pass
7	Maximum Permissible Exposure (MPE) CFR47 FCC Part 1.1310: 09/2019, CFR47 FCC Part 2.1091: 09/2019	
8	6 dB Bandwidth and Occupied Bandwidth CFR47 FCC Part 15 Subpart C: 09/2019, Section 15.247 (a)(2)	Pass
9	Maximum Power Spectral Density CFR47 FCC Part 15 Subpart C: 09/2019, Section 15.247 (e)	Pass
10	Band Edge Compliance CFR47 FCC Part 15 Subpart C: 09/2019, Section 15.247 (d)	Pass
11	Transmitter spurious emissions CFR47 FCC Part 15 Subpart C: 09/2019, Section 15.247 (d)	Pass
12	Digital Device and Receiver Radiated Spurious Emissions (CFR47 FCC Part 15 Subpart B 15.109: 09/2019,	Pass
13	AC Mains Conducted Emissions FCC 47CFR Part 15.107: 09/2019	Pass
14	Revision History	

3 Client Information

This EUT was tested at the request of:

Client:	iRobot Corporation 8 Crosby Dr Mail Stop 12-2 Bedford, MA 01730 USA
Contact:	Stephen Pallotta
Telephone:	+1 (781) 430-3284
Fax:	None
Email:	spallotta@irobot.com

4 Description of Equipment Under Test and Variant Models

Manufacturer:	iRobot Corporation
	8 Crosby Dr Mail Stop 12-2
	Bedford, MA 01730
	USA

Equipment Under Test					
Description Manufacturer Model Name Model Number Serial Number					
WiFi Module	iRobot Corporation	Sundial	AXF-Y1	P1 FCC #1	

Receive Date:	07/16/2019
Received Condition:	Good
Type:	Production

Description of Equipment Under Test (provided by client)

The equipment under test is a WiFi Module

Equipment Under Test Power Configuration					
Rated Voltage Rated Current Rated Frequency Number of Phases					
5 VDC	N/A	N/A	N/A		

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	Tx mode
2	Rx mode

Software used by the EUT:

No.	Descriptions of EUT Exercising
1	Test script was provided by client

Radio/Receiver Characteristics			
Frequency Band(s) 2412-2462 MHz			
Modulation Type(s)	IEEE 802.11b, IEE 802.11g, IEEE 802.11n HT20,		
	IEEE 802.11n HT40		
Maximum Output Power	25.02 dBm (Conducted Power)		
Test Channels	Low (2412 MHz)		
	Mid (2442 MHz)		
	High (2462 MHz)		
Occupied Bandwidth			
	See data sections		
6 dB Bandwidth	See data sections		
Frequency Hopper: Number of Hopping			
Channels	N/A		
Frequency Hopper: Channel Dwell Time	N/A		
Frequency Hopper: Max interval between			
two instances of use of the same channel	N/A		
MIMO Information (# of Transmit and			
Receive antenna ports) N/A			
Equipment Type	Module		
Antenna Type and Gain	Integral, +4 dBi		

Variant Models:

The following variant models were not tested as part of this evaluation, but have been identified by the manufacturer as being electrically identical models, depopulated models, or with reasonable similarity to the model(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

None

5 System Setup and Method

Cables						
ID	Description	Length (m)	Shielding	Ferrites	Termination	
-	Power Cable	2	None	None	AC Mains	

Support Equipment					
Description	Manufacturer	Model Number	Serial Number		
Laptop	DELL	LATITUDE E5440	Not Labelled		
USB AC Adapter	Apple	A1385	Not Labelled		

5.1 Method:

Configuration as required by Configuration as required by FCC Part 15 Subpart C 15.247: 09/2019, FCC Part 15 Subpart B: 09/2019, CFR47 FCC Part 1.1310: 09/2019, CFR47 FCC Part 2.1091: 09/2019, ANSI C 63.10: 2013, ANSI C 63.4: 2014, and KDB 558074 D01 15.247 Meas Guidance v05r02.

5.2 EUT Block Diagram:



6 Maximum Peak Output Power

6.1 Method

Tests are performed in accordance with CFR47 FCC Part 15.247, ANSI C63.10, and KDB 558074.

TEST SITE: EMC Lab

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

6.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
CEN001'	DC-40GHz attenuator 20dB	Centric RF	C411-20	CEN001	02/01/2019	02/01/2020
CBLHF2012-2M-1'	2m 9kHz-40GHz Coaxial Cable - SET1	Huber & Suhner	SF102	252675001	02/01/2019	02/01/2020
ROS005-1'	Signal and Spectrum Analyzer	Rohde & Schwarz	FSW43	100646	10/15/2018	10/15/2019
DS40'	Temp, humidity, pressure gauge	Digi Sense	68000-49	181717625	11/06/2018	11/06/2019

Software Utilized:

Name	Manufacturer	Version
None		

6.3 Results:

The sample tested was found to Comply.

§15.247 (b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt or 30 dBm.

Channel	Frequency (MHz)	Data Rate (Mbps)	Conducted Output Power (dBm)
Low	2412	1	15.07
Mid	2442	1	15.14
High	2462	1	15.02
Low	2412	2	15.46
Mid	2442	2	15.14
High	2462	2	15.31
Low	2412	5.5	16.77
Mid	2442	5.5	16.87
High	2462	5.5	16.74
Low	2412	11	18.52
Mid	2442	11	18.62
High	2462	11	18.73

Modulation: IEEC 802.11b, Bandwidth: 20 MHz

Modulation: IEEC 802.11g, Bandwidth: 20 MHz

Channel	Frequency (MHz)	Data Rate (Mbps)	Conducted Output Power (dBm)
Low	2412	6	20.83
Mid	2442	6	20.57
High	2462	6	20.72
Low	2412	9	21.24
Mid	2442	9	21.05
High	2462	9	21.92
Low	2412	12	21.48
Mid	2442	12	21.16
High	2462	12	21.12
Low	2412	18	21.76
Mid	2442	18	21.49
High	2462	18	21.73
Low	2412	24	21.62
Mid	2442	24	21.46
High	2462	24	21.45
Low	2412	36	21.70
Mid	2442	36	21.63
High	2462	36	21.49
Low	2412	48	21.72
Mid	2442	48	21.62
High	2462	48	21.91
Low	2412	54	21.56
Mid	2442	54	21.70
High	2462	54	21.42

Channel	Frequency (MHz)	Data Rate (Mbps)	Conducted Output Power (dBm)
Low	2412	MCS0	20.72
Mid	2442	MCS0	20.71
High	2462	MCS0	20.54
Low	2412	MCS1	21.15
Mid	2442	MCS1	21.02
High	2462	MCS1	20.80
Low	2412	MCS2	20.77
Mid	2442	MCS2	21.05
High	2462	MCS2	20.81
Low	2412	MCS3	21.41
Mid	2442	MCS3	21.45
High	2462	MCS3	21.35
Low	2412	MCS4	21.48
Mid	2442	MCS4	21.47
High	2462	MCS4	21.75
Low	2412	MCS5	21.42
Mid	2442	MCS5	21.43
High	2462	MCS5	21.53
Low	2412	MCS6	21.67
Mid	2442	MCS6	21.45
High	2462	MCS6	21.57
Low	2412	MCS6	21.47
Mid	2442	MCS7	21.50
High	2462	MCS7	21.53

Modulation: IEEC 802.11n HT20, Bandwidth: 20 MHz

Modulation: IEEC 802.11n HT40, Bandwidth: 40 MHz

Channel	Frequency (MHz)	Data Rate (Mbps)	Conducted Output Power (dBm)
Low	2412	MCS0	23.77
Mid	2442	MCS0	23.61
High	2462	MCS0	24.09
Low	2412	MCS1	24.01
Mid	2442	MCS1	24.21
High	2462	MCS1	24.00
Low	2412	MCS2	24.18
Mid	2442	MCS2	23.94
High	2462	MCS2	24.16
Low	2412	MCS3	24.93
Mid	2442	MCS3	24.88
High	2462	MCS3	24.90
Low	2412	MCS4	24.87
Mid	2442	MCS4	24.69
High	2462	MCS4	24.74
Low	2412	MCS5	24.74
Mid	2442	MCS5	24.82
High	2462	MCS5	25.01
Low	2412	MCS6	24.94
Mid	2442	MCS6	25.02
High	2462	MCS6	24.82
Low	2412	MCS7	24.63
Mid	2442	MCS7	24.70
High	2462	MCS7	24.81

6.4 Setup Photograph:



6.5 Plots/Data:



Modulation: 802.11b, Bandwidth: 20 MHz, 1 Mbps, Low Channel

04:21:44 28.09.2019

Ref Level 20.00 dBm Att 30 dB SW	* RBW 1 1.01 ms * VBW	i MHz S MHz Mode Av	uto Sweep					10
TDP LACLB	- 10 - 11 - 11 - 11 - 11 - 11 - 11 - 11	and excerning	000000000000000000000000000000000000000					E Partier
				-			мц1]	7.08 dBa
10 d8m		فسننب		d				
0 d9m							-	-
-10 08m							-	
-20 dBm								
-30 dbm								
-40 dBm								
-\$0 dBm							-	
-60 dBm								
-70 d8m								
CF 2.442 GHz		1001 pts			1.5 MHz/		-	Span 15.0 MHz
2 Result Summary Channel Tx1 (Ref) Tx Total	Bandwidth 10.000 MHz	I.	No Offset	ne	Power 15.14 dBm 15.14 dBm	Ĩ.		34

Modulation: 802.11b, Bandwidth: 20 MHz, 1 Mbps, Mid Channel

04:20:45 28.09.2019



Modulation: 802.11b, Bandwidth: 20 MHz, 1 Mbps, High Channel

04:18:54 28.09.2019





04:24:01 28.09.2019



Modulation: 802.11b, Bandwidth: 20 MHz, 2 Mbps, Mid Channel

04:20:45 28.09.2019





04:26:51 28.09.2019



Modulation: 802.11b, Bandwidth: 20 MHz, 5.5 Mbps, Low Channel

04:30:49 28.09.2019





04:30:05 28.09.2019



Modulation: 802.11b, Bandwidth: 20 MHz, 5.5 Mbps, High Channel

04:29:15 28.09.2019





04:34:32 28.09.2019

9 MultiView Spectrum Ref Level 20.00 dBm = RBW 1 MHz SWT 1.01 ms = VBW 3 MHz Att 30.48 Mode Auto Sweep 1 ACLR 1Pic Max VII [1] 10.59 dB 4413260 GHz 10 dêr TCT. 10 dBs -20.dBs SD dBt 40.cB \$0.d8 60 d8 10 08 ¥ 2.442 GHz 1001 pts 1.5 MHz/ Span 15.0 MHz 2 Result Summary None Power 18.62 dBm 18.62 dBm Bandwidth T Offset T Channel 1 Tx1 (Ref) Tx Total 10.000 MHz 04:35:30 Measuring...

Modulation: 802.11b, Bandwidth: 20 MHz, 11 Mbps, Mid Channel

04:35:31 28.09.2019

Modulation: 802.11b, Bandwidth: 20 MHz, 11 Mbps, High Channel



04:36:24 28.09.2019



02:18:45 28.09.2019





02:20:07 28.09.2019



02:21:25 28.09.2019





02:15:47 28.09.2019



02:14:32 28.09.2019





02:12:49 28.09.2019



02:06:12 28.09.2019





02:08:28 28.09.2019

MultiView D Spect	FREW	(1 MHz SMHz Mode &	to Sween				
10 den-			The second s				MI[1] 11,10 dBm 2,4636100 GHz
0 den							Annanak Annanak
-60 dBm							
CF 2.462 GHz		1001 pts			2.6 MHz/		Span 26.0 MHz
2 Result Summary Channel Tx1 (Ref) Tx Total	Bandwidth 17.000 MHz	k	Nor Offset	¢	Power 21.12 dBm 21.12 dBm	l.	
l J)	Measuring CEE	28.09.2019 02:10:00

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 12 Mbps, High Channel

02:10:00 28.09.2019





02:03:27 28.09.2019

Ref Level 20. Att	00 dBm 30 dB = \$¥	* PBW (1 500 ms * VBW	1 MHz 3 MHz Mode A	uto Sweep						
1 ACLR	عازر معدمان									Pic Max
							I M3	_	мц[1]	11.66 dBn
18 dêm					TVO	-	unter and	WEARING		2,4449010 GH:
	2	- Martine Contraction			1303				u.	
0 d9m	1								- Star	
	1								No.	
-10 cBsi										N.
-20 0811									-	1
and a second second										Mannes
-30 dbsi										
883825										
-40 cBti										
-50 (81)										
0200000										
-60 d8m										
3232-5										
-70 dBm										
207 0 1 2 2 2 2 2 2										
2 Result Summ	3037		1001 prs	-	Alana		Z.6 MHZ/		-1 2	span 26.0 WH2
Channe	월	Bandwidth	1.	Offset	(Marine)	1	Power	1		
The second secon		17,000 MHz					21.49 dBm			

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 18 Mbps, Mid Channel

02:01:43 28.09.2019





01:59:10 28.09.2019



Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 24 Mbps, Low Channel

02:26:26 28.09.2019







02:23:57 28.09.2019





02:29:16 28.09.2019



02:30:14 28.09.2019





02:31:12 28.09.2019



Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 48 Mbps, Low Channel

02:37:05 28.09.2019





02:36:16 28.09.2019



Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 48 Mbps, High Channel

02:34:55 28.09.2019





02:39:43 28.09.2019



02:40:41 28.09.2019





02:41:27 28.09.2019

Modulation: 802.11n HT20 MCS0, Low Channel



02:50:52 28.09.2019





02:49:54 28.09.2019

Modulation: 802.11n HT20 MCS0, High Channel



02:46:39 28.09.2019





02:53:56 28.09.2019

Modulation: 802.11n HT20 MCS1, Mid Channel



02:55:07 28.09.2019





02:55:53 28.09.2019

Modulation: 802.11n HT20 MCS2, Low Channel

03:00:46 28.09.2019

02:59:58 28.09.2019

Modulation: 802.11n HT20 MCS2, High Channel

02:58:33 28.09.2019

03:02:56 28.09.2019

Modulation: 802.11n HT20 MCS3, Mid Channel

03:03:52 28.09.2019

03:04:46 28.09.2019

Modulation: 802.11n HT20 MCS4, Low Channel

03:09:27 28.09.2019

03:08:36 28.09.2019
Modulation: 802.11n HT20 MCS4, High Channel



03:07:41 28.09.2019





03:11:44 28.09.2019

Modulation: 802.11n HT20 MCS5, Mid Channel



03:12:33 28.09.2019





03:13:31 28.09.2019

Modulation: 802.11n HT20 MCS6, Low Channel



03:17:33 28.09.2019





03:16:42 28.09.2019

Modulation: 802.11n HT20 MCS6, High Channel



03:15:44 28.09.2019





03:20:01 28.09.2019

Modulation: 802.11n HT20 MCS7, Mid Channel



03:20:53 28.09.2019





03:21:53 28.09.2019

Modulation: 802.11n HT40 MCS0, Low Channel



03:33:08 28.09.2019





03:31:48 28.09.2019

Modulation: 802.11n HT40 MCS0, High Channel



03:29:40 28.09.2019





03:35:53 28.09.2019

Modulation: 802.11n HT40 MCS1, Mid Channel



03:37:04 28.09.2019





03:37:58 28.09.2019

Modulation: 802.11n HT40 MCS2, Low Channel



03:43:18 28.09.2019





03:41:40 28.09.2019

Modulation: 802.11n HT40 MCS2, High Channel



03:40:47 28.09.2019





03:46:32 28.09.2019

Modulation: 802.11n HT40 MCS3, Mid Channel



03:47:55 28.09.2019





03:49:10 28.09.2019

Modulation: 802.11n HT40 MCS4, Low Channel



03:53:55 28.09.2019





03:52:50 28.09.2019

Modulation: 802.11n HT40 MCS4, High Channel



03:51:46 28.09.2019



03:56:31 28.09.2019

Modulation: 802.11n HT40 MCS5, Mid Channel



03:57:35 28.09.2019





03:58:35 28.09.2019

Modulation: 802.11n HT40 MCS6, Low Channel



04:03:05 28.09.2019





04:02:05 28.09.2019

Modulation: 802.11n HT40 MCS6, High Channel



04:01:03 28.09.2019





04:05:31 28.09.2019

Modulation: 802.11n HT40 MCS7, Mid Channel



04:06:41 28.09.2019





04:08:57 28.09.2019

	Intertek						
Report Number: 104	076035BOX-001c		Issued: 10/03/2019 Re-issued: 11/04/2019				
Test Personnel: Supervising/Reviewing Engineer: (Where Applicable)	Vathana Ven	Test Date:	09/26/2019				
Product Standard: Input Voltage:	CFR47 FCC Part 15.247 5 VDC (USB)	Limit Applied:	See report section 6.3				
Pretest Verification w/ Ambient Signals or	, <i>i</i>	Ambient Temperature:	22 °C				
BB Source:	N/A	Relative Humidity:	<u>62 %</u>				
		Atmospheric Pressure:	TUTU mbars				

Deviations, Additions, or Exclusions: None

7 Maximum Permissible Exposure (MPE)

7.1 Method

Tests are performed in accordance with CFR47 FCC Part 15.247, CFR47 FCC Part 1.1310, CFR47 FCC Part 2.1091, ANSI C63.10, and KDB 558074.

TEST SITE: EMC Lab

<u>The EMC Lab</u> has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

7.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
CEN001'	DC-40GHz attenuator 20dB	Centric RF	C411-20	CEN001	02/01/2019	02/01/2020
CBLHF2012-2M-1'	2m 9kHz-40GHz Coaxial Cable - SET1	Huber & Suhner	SF102	252675001	02/01/2019	02/01/2020
ROS005-1'	Signal and Spectrum Analyzer	Rohde & Schwarz	FSW43	100646	10/15/2018	10/15/2019
DS40'	Temp, humidity, pressure gauge	Digi Sense	68000-49	181717625	11/06/2018	11/06/2019

Software Utilized:

Name	Manufacturer	Version
None		

7.3 Results:

The sample tested was found to Comply.

Limit for Maximum Permissible Exposure (MPE) per FCC Part §1.1310: Table 1

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
	(A) Limits for Oc	cupational/Controlled Exp	osure	
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	<mark>0.1</mark> 63	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
	(B) Limits for Genera	al Population/Uncontrolled	Exposure	
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

7.4 Setup Photograph:



7.5 MPE Calculation:

An MPE evaluation for was performed in order to show that the device was compliant with FCC Part §1.1310 and FCC Part §2.1091. The maximum power density was calculated for each transmitter at a separation distance of 20 cm.

For each transmitter the maximum RF exposure at a 20 cm distance using the formula: $ConductedPower_{mW} = 10^{ConductedPower(dBm)/10}$

$$PowerDensity = \frac{ConductedPower_{mW} \times Ant.Gain}{4\pi \times (20_{cm})^2}$$

Maximum Permissible Exposure (MPE)

Maximum Conducted Output Power (Report Section 6.3) = 25.02 dBm = 317.687407 mW

Maximum Antenna Gain = $4 \text{ dBi} = 10^{(1.5/10)} = 2.512$

Power Density = (317.687407*2.512)/ 5025.6

Power Density = 0.158793 mW/cm²

FCC Exposure Limit at 2.442 GHz = 1mW/cm²

The calculated maximum power density at 20cm distance is less than the limit for general population / uncontrolled exposure.

Safe Distance Maximum Permissible Exposure (MPE)

FCC Limit For General Population/Uncontrolled Exposure at 2.442 GHz = 1 mW/cm²

Power Density = [EIRP] / $[4\pi x (D_{cm})^2]$

Where EIRP is in milliwatts and D is in centimeters. Setting the power density equal to the limit of 1 mW/cm^2 and solving for D_{cm} yields the following results.

Results:

EUT EIRP = Conducted power + Array Gain + Antenna gain in dBi

Power Density Limit = [EIRP] / $[4\pi \times (D_{cm})^2]$ 1 mW/cm² = [EIRP] / $[4\pi \times (D_{cm})^2]$ D_{cm} = ([EIRP] / $[4\pi]$)^{1/2} For Gain = 4 dBi, EIRP = 25.02 dBm + 4 dBi EIRP = 29.02 dBm or 798 mW Therefore, the minimum safe distance D_{cm} = ([798] / $[4\pi]$)^{1/2} D_{cm} = 7.97 cm

	Intertek							
Report Number: 104	076035BOX-001c		Issued: 10/03/2019 Re-issued: 11/04/2019					
Test Personnel: Supervising/Reviewing Engineer: (Where Applicable)	Vathana Ven	Test Date:	09/26/2019					
Product Standard: Input Voltage:	CFR47 FCC Part 15.247 5 VDC (USB)	Limit Applied:	See report section 7.3					
Pretest Verification w/		Ambient Temperature:	22 °C					
BB Source:	N/A	Relative Humidity:	62 %					
		Atmospheric Pressure:	1010 mbars					

Deviations, Additions, or Exclusions: None

8 6 dB Bandwidth and Occupied Bandwidth

8.1 Method

Tests are performed in accordance with CFR47 FCC Part 15.247, ANSI C63.10, and KDB 558074.

TEST SITE: EMC Lab

<u>The EMC Lab</u> has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

8.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
CEN001'	DC-40GHz attenuator 20dB	Centric RF	C411-20	CEN001	02/01/2019	02/01/2020
CBLHF2012-2M-1'	2m 9kHz-40GHz Coaxial Cable - SET1	Huber & Suhner	SF102	252675001	02/01/2019	02/01/2020
ROS005-1'	Signal and Spectrum Analyzer	Rohde & Schwarz	FSW43	100646	10/15/2018	10/15/2019
DS40'	Temp, humidity, pressure gauge	Digi Sense	68000-49	181717625	11/06/2018	11/06/2019

Software Utilized:

Name	Manufacturer	Version
None		

8.3 Results:

The sample tested was found to Comply.

§15.247 (a) (2) Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Intertek

Modulation: IEEC 802.11b, Bandwidth: 20 MHz

Channel	Frequency (MHz)	Data Rate (Mbps)	6 dB Bandwidth (MHz)	Occupied Bandwidth (MHz)
Low	2412	1	10.04	14.40
Mid	2442	1	10.05	14.00
High	2462	1	10.06	14.40
Low	2412	2	9.78	14.30
Mid	2442	2	9.85	14.10
High	2462	2	9.83	14.50
Low	2412	5.5	9.58	13.90
Mid	2442	5.5	9.35	13.70
High	2462	5.5	9.46	14.10
Mid	2442	11	9.57	13.70
High	2462	11	9.69	14.20

Modulation: OFDM 802.11g, Bandwidth: 20 MHz

Channel	Frequency	Data Rate	6 dB Bandwidth	Occupied Bandwidth
		(wops)		(MHz)
Low	2412	6	16.32	16.89
Mid	2442	6	16.32	16.80
High	2472	6	16.05	17.10
Low	2412	9	16.16	16.68
Mid	2442	9	16.29	16.50
High	2472	9	16.32	16.90
Low	2412	12	16.35	16.75
Mid	2442	12	16.37	16.50
High	2472	12	16.32	16.70
Low	2412	18	16.37	16.55
Mid	2442	18	16.38	16.50
High	2472	18	16.34	16.80
Low	2412	24	16.37	16.46
Mid	2442	24	16.34	16.40
High	2472	24	16.34	16.60
Low	2412	36	16.33	16.50
Mid	2442	36	16.30	16.60
High	2472	36	16.32	16.40
Low	2412	48	16.36	16.46
Mid	2442	48	16.33	16.40
High	2472	48	16.36	16.60
Low	2412	54	16.30	16.51
Mid	2442	54	15.99	16.40
High	2472	54	16.33	16.60

Intertek

Report Number: 104076035BOX-001c

Modulation: IEEC 802.11n HT20, Bandwidth: 20 MHz

Channel	Frequency (MHz)	Data Rate (Mbps)	6 dB Bandwidth (MHz)	Occupied Bandwidth
				(MHz)
Low	2412	MCS0	17.53	17.81
Mid	2442	MCS0	17.53	17.87
High	2462	MCS0	17.53	17.51
Low	2412	MCS1	17.61	17.69
Mid	2442	MCS1	17.62	17.73
High	2462	MCS1	17.55	17.49
Low	2412	MCS2	17.58	17.67
Mid	2442	MCS2	17.61	17.68
High	2462	MCS2	17.58	17.71
Low	2412	MCS3	17.54	17.62
Mid	2442	MCS3	17.58	17.63
High	2462	MCS3	17.65	17.60
Low	2412	MCS4	17.58	17.59
Mid	2442	MCS4	17.59	17.63
High	2462	MCS4	17.63	17.61
Low	2412	MCS5	17.60	17.60
Mid	2442	MCS5	17.62	17.61
High	2462	MCS5	17.66	17.60
Low	2412	MCS6	17.60	17.54
Mid	2442	MCS6	17.66	17.54
High	2462	MCS6	17.61	17.56
Low	2412	MCS7	17.51	17.56
Mid	2442	MCS7	17.53	17.56
High	2462	MCS7	17.44	17.54

Intertek

Report Number: 104076035BOX-001c

Modulation: IEEC 802.11n HT40, Bandwidth: 40 MHz

meddiadeni iEEe c	oen nin no, Banan			
Channel	Frequency	Data Rate	6 dB Bandwidth	Occupied
	(MHz)	(Mbps)	(MHz)	Bandwidth
				(MHz)
Low	2412	MCS0	36.26	36.96
Mid	2442	MCS0	36.26	37.16
High	2462	MCS0	36.27	36.88
Low	2412	MCS1	36.30	36.66
Mid	2442	MCS1	36.30	36.80
High	2462	MCS1	36.26	36.62
Low	2412	MCS2	36.27	36.50
Mid	2442	MCS2	36.33	36.74
High	2462	MCS2	36.36	36.68
Low	2412	MCS3	36.33	36.49
Mid	2442	MCS3	36.22	36.51
High	2462	MCS3	36.31	36.12
Low	2412	MCS4	36.26	36.39
Mid	2442	MCS4	36.30	36.15
High	2462	MCS4	35.98	36.36
Low	2412	MCS5	36.22	36.43
Mid	2442	MCS5	36.27	36.49
High	2462	MCS5	36.31	36.35
Low	2412	MCS6	36.28	36.14
Mid	2442	MCS6	36.27	36.22
High	2462	MCS6	36.23	36.12
Low	2412	MCS7	35.93	36.10
Mid	2442	MCS7	36.25	36.20
High	2462	MCS7	36.32	36.10

8.4 Setup Photograph:



8.5 Plots/Data:



Modulation: 802.11b, Bandwidth: 20 MHz, 1 Mbps, Low Channel – 6 dB Bandwidth

12:48:03 26.09.2019

Modulation: 802.11b, Bandwidth: 20 MHz, 1 Mbps, Mid Channel – 6 dB Bandwidth

MultiView	Spectrum	1							
Ref Level -5.0	0 dBm 20 dB SWT 1	96 un (~21 ms)	RBW 100 WBW 300	kHz kHz Mode Auto (ΨT.				14
1 Frequency Sv	weep						X/		21Pk Max
10 dim				01	and the second s			D3[1]	-5.98 dB
- And			53	, which have	MUMAN	. 00		141111	4.50800 MHz
-20 dBm	H2 -17, 160	cRin .	F	4	1	July 1		melti	43647800 GH
			white			1/ New			
-30 d8m		w	2.5 . 18	-		4	A.		
		Y					1		
-40 dBm		J.		-		-	1		
	a ha poly	T					1	1 243 245 1	
-50 CBR	A. A.	1				-		Jones and	12
mar V							1 1/	200	11 June
-90 cBm		V I					1 V		1. 1
		¥ .					Y		1
-70 dbm-									
175 (194)									
-93 d8m									
-100 d8m					-	-			
CE 2:437 GHz			10000	nts		4.0 MHz/		<u> </u>	Span 40.0 MHz
2 Marker Table		22.00.000.000	10000			the the start			April 1010 He la
Type Ref M1 D2 M1 D3 M1	Trc 2.	X-Value 436478 GH 5.54 MH -4.508 MH	z z z	V-Value -11.16 dBm -5.89 dB -5.98 dB		Function	Ŀ	Function R	esult
1	J.						Measuring	a simmin .	26.09.2019 12:54:04

12:54:04 26.09.2019



Modulation: 802.11b, Bandwidth: 20 MHz, 1 Mbps, High Channel - 6 dB Bandwidth

12:57:59 26.09.2019

Modulation: 802.11b, Bandwidth: 20 MHz, 2 Mbps, Low Channel - 6 dB Bandwidth



13:03:10 26.09.2019



13:06:22 26.09.2019





13:09:16 26.09.2019



Modulation: 802.11b, Bandwidth: 20 MHz, 5.5 Mbps, Low Channel - 6 dB Bandwidth

13:17:02 26.09.2019

Modulation: 802.11b, Bandwidth: 20 MHz, 5.5 Mbps, Mid Channel - 6 dB Bandwidth



13:20:16 26.09.2019



Modulation: 802.11b, Bandwidth: 20 MHz, 5.5 Mbps, High Channel - 6 dB Bandwidth

13:23:12 26.09.2019

Modulation: 802.11b, Bandwidth: 20 MHz, 11 Mbps, Low Channel - 6 dB Bandwidth



13:26:09 26.09.2019



13:28:55 26.09.2019





13:31:47 26.09.2019

Modulation: 802.11b, Bandwidth: 20 MHz, 1 Mbps, Low Channel – Occupied Bandwidth



Date: 25.SEP.2019 20:34:35

Modulation: 802.11b, Bandwidth: 20 MHz, 1 Mbps, Mid Channel - Occupied Bandwidth



Date: 25.SEP.2019 20:33:39

Modulation: 802.11b, Bandwidth: 20 MHz, 1 Mbps, High Channel – Occupied Bandwidth



Date: 25.SEP.2019 20:32:15

Modulation: 802.11b, Bandwidth: 20 MHz, 2 Mbps, Low Channel - Occupied Bandwidth



Date: 25.SEP.2019 20:41:35



Modulation: 802.11b, Bandwidth: 20 MHz, 2 Mbps, Mid Channel - Occupied Bandwidth

Date: 25.SEP.2019 20:42:35

Modulation: 802.11b, Bandwidth: 20 MHz, 2 Mbps, High Channel – Occupied Bandwidth



Date: 25.SEP.2019 20:43:47
Modulation: 802.11b, Bandwidth: 20 MHz, 5.5 Mbps, Low Channel – Occupied Bandwidth



Date: 25.SEP.2019 20:49:44

Modulation: 802.11b, Bandwidth: 20 MHz, 5.5 Mbps, Mid Channel - Occupied Bandwidth



Date: 25.SEP.2019 20:48:45

Modulation: 802.11b, Bandwidth: 20 MHz, 5.5 Mbps, High Channel – Occupied Bandwidth



Date: 25.SEP.2019 20:47:52

Modulation: 802.11b, Bandwidth: 20 MHz, 11 Mbps, Low Channel – Occupied Bandwidth



Date: 25.SEP.2019 20:54:21

Modulation: 802.11b, Bandwidth: 20 MHz, 11 Mbps, Mid Channel – Occupied Bandwidth

Intertek



Date: 25.SEP.2019 20:55:18

Modulation: 802.11b, Bandwidth: 20 MHz, 11 Mbps, High Channel - Occupied Bandwidth



Date: 25.SEP.2019 20:56:04



13:35:50 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 6 Mbps, Mid Channel – 6dB Bandwidth



13:38:47 26.09.2019



Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 6 Mbps, High Channel – 6dB Bandwidth

13:40:55 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 9 Mbps, Low Channel – 6 dB Bandwidth



13:44:25 26.09.2019



13:46:31 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 9 Mbps, High Channel- 6 dB Bandwidth

MultiView	Spectrum								
Ref Level -5.00	odem 20.48 swr	168 ur (w25 me)	RBW 100 ki	H2 Hz Mode Auto	PPT				1
1 Frequency Sw	eep	100 13 (765 112	1011 000 1	12 Mode Adio			(i)		= 1Pk Max
-10 dBm				- HA				D3[1]	-6.20 dł
-20.dbn	1010100000	0 -619	THURAMAN	www.www.www.	MARKAMAN	MANAMAN		M1[1]	-14,29 dBn
	14.540.51				¥	9			
-30 dBm			1	-	-	h			
-40 dBm		Man alla alla	200 A				Why alaly		
	NW MANNAU	HANNE AN.					a filmant M	Here Workshow	
NAW WWW									Alter Rasa
-60 dBm					1		-		and a
-70 dbn									
-00 c0m									
-90 dBm									
-100 d8m-									
CF 2.462 GHz			10000 p	ts	4	.5 MHz/		-	pan 45.0 MHz
2 Marker Table Type Ref M) D2 ML D3 ML	Trc 2	X-Value 4613903 G 8.757 M -7.56 M	Hz - Hz Hz	V-Vakæ 14.29 dBm -6.16 dB -6.20 dB	Ê	Function		Function Re	sult
	J.						Measuring	(Contraction)	26.09.2019 13:48:14

13:48:14 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 12 Mbps, Low Channel – 6 dB Bandwidth

Ref Level -5 Att	.00.d8m 20.d8 SWT	168 µs (~25 ms	PBW 100 9 WBW 300	kHz kHz Mode Auto I	FFT				
Frequency 1	Sweep		1		0.		()		1Pk Max
10 dBm					1441			D3[1]	-6.05 d
-	-11-14.000 dam				Ante daire			141613	-9.06750 MH
20 cbm	82-20.00	D CRIM	DELADONNAN	CVP/Annana and a	La canal de la canal	Manyman		burf 11	11288490 GH
	V7022910		- Construction	1		9		e.	12.003.00 013
-30 d8m			1						
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- 40 chm	-	1. Martin)	Mrs.		
	AVERA .	Provention.					nyman	Man	
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ANT AVAIL									THE REAL PROPERTY AND INCOMENTAL OFFICE AND INCOMENTAL OFFICIA AND INCOMENTAL ANDO INCOMENTALA ANDO INCOMEN
POD OBILI-	1				1 1				
-70 dbn-									
-80 dBn-		-					-		
-90 dBm	-								
-100 d8m	-	-	-		-		-	-	
F 2.412 GHz			10000	ots	4	5 MHz/			pan 45.0 MHz
2 Marker Tab	le	100000000		C. Secondaria			A.2.	NG - 2003-0-40	
Type Re	f Trc	X-Value	s: 1	V-Value	E.	Function	E	Function Re	sult
M)	1 2	4128843 G	HZ	-14.00 dBm					
D3 M	1	-9.0675 M	Hz	-6.05 dB					
	1						C		444 26 09 2019

13:51:40 26.09.2019



Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 12 Mbps, Mid Channel – 6 dB Bandwidth

13:55:25 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 12 Mbps, High Channel- 6 dB Bandwidth



13:57:17 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 18 Mbps, Low Channel - 6 dB Bandwidth



13:59:37 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 18 Mbps, Mid Channel – 6 dB Bandwidth



14:04:59 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 18 Mbps, High Channel- 6 dB Bandwidth

Ref Level -5.0	J Spectrum OdBm		# RBW 100	kHz	9(847)				
Att	20 dB SWT	168 µs (∻25 ms).	• VBW 300	ktiz Mode Auto	FFT			N	A PARTY APPART
T Thequericy and	CCD.							D3[1]	-6.02 dB
+10 dBm				H	10000				-7.25400 MHz
			bo a second of	MANANANANA	MANAWAMANA	Marine Int		M1[1]	-13.98 dBm
-20 dBn	H2 -20,27	0 dini	Party and a state	8		manne	-	- 2	46106175 GHz
				1.5		1			
-30 dBm		~	r -			1	Prove State		
		AND T	012				Mr.		
-40 dBm	. In sold	MANN					Mu Minat	and the second second	
	MAMMIN	2.08 h 1905 C						T VIMMANU.	(C
-SO CBRI	1000							1 44	hullis
WINN THE									THE PLANE
P60 dBm	Ĩ								
-70 dbn									
-00 c0n									
-90 CBIN									
and the second second									
-100 6800-									
CF 2.462 GHz			10000	pts	4	.5 MHz/			Span 45.0 MHz
2 Marker Table	I Tran I	M Haller	. W	and and an	Č.	- 20 - St.	í.		
MI Ref	1 2.	46106175 G	Hz	-13.98 dBm	11	Function	1	Function R	esuit
D2 M1	i	9.09 M	Hz	-6.03 dB					
D3 M1	1	-7.254 M	HZ	-6.02 dB					

14:07:10 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 24 Mbps, Low Channel – 6 dB Bandwidth

Ref Level -5.0	Spectrum OdBm	۰ <u>ل</u>	# PBW 100	kHz	22371				4
Att	20 dB SWT	168 µs (~25 ms) = YBW 300	ktiz Mode Auto	FFT				THE MAKE
	Conception of the second se						1	D3[1]	-6.07 df
-10 dBm				and the second s	legy gover groups a			-	7.25850 MH
		1	PE-ANAUAAAA	MANAMANAM	hanner warden	Whitehand		M1[1]	-13.60 dBn
-20 UBM		00 :0n	1	1		1		2,	#1107080 GH
-30 dBm		-	1		-	4		-	
-40 dBm-		and the second	1				Nay		
	the same for the	hanning and					MAMM	all whether	
-SO CBA	Aldare							. THERE WAS	Maywork
AR/den-				-					
-70 dbn							-		
-00 c0n						-			
-90 d8m				-					
-100 d8m							-		
CF 2.412 GHz			10000	pts	4	.5 MHz/			ipan 45.0 MHz
2 Marker Table	1	71.01025325	- W		55	26 13	6.6	106 - 1067 - 20-217	Ča – s
Type Ref M1 D2 M1 D3 M1 M1	Trc 2	X-Value 1.4110708 G 9.1125 M -7.2585 M	Hz Hz Hz	V-Vake -13.60 dBm -6.09 dB -6.07 dB		Function	1 ²	Function Re	esult
i.	1						Measuring	HE STREET,	4 26.09.2019 14:10:48

14:10:49 26.09.2019



Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 24 Mbps, Mid Channel - 6 dB Bandwidth

14:12:53 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 24 Mbps, High Channel – 6 dB Bandwidth

MultiView	Spectrum	6 J							
Ref Level -5.0	0 dBm	and the star of	• RBW 10	0 kHz	9(817)				1
Att Energyency St	20 db SWT	168 µs (~25 ms) . ARM 20	0 kHz Mode Auto	FFT				PRIMA
					100			D3[1]	-6.08 di
-10 dBm	1-33.230 d8m-								9,12600 MH
	10.10.0		DSMANNAR!	raymony www.	In which whi	Westware P		M1[1]	-13.23 d8n
20.088	and the state	Jusan	P		1	i nal		2	46293830 GH
-			1						
- au can		1 3	1			3	015		
- 40 cfbm		NA					Mure.		
100,0800	in the set	LapphMen					Phy is Minne	Asi.	
-50 (84)	and the property of	1.104					10	WINANA AND	
MARCHNER	Part -							aller	WWW.4
ABR CBm		-						-	MANNE
-70 dbn		-			-		-		
-80 dBn		-							
-90 d8m						-	-	-	
-100 d8m-		-		-	-		-	-	-
CF 2.462 GHz			1000	0 pts	4	.5 MHz/	I		Span 45.0 MHz
2 Marker Table		2010/02/02		Margan and Constant of Constan			A.24	NG 897G-10	
Type Ref	Trc	X-Value	22 I	V-Value	- R	Function	1	Function R	esult
M) D2 / MI	1 4	7.218 M	HZ	-13.23 dBm -5.95 dB					
D3 M1	ां	-9.126 M	Hz	-6.08 dB					
9	10						Measuring	an contract	26.09.2019

14:14:38 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 36 Mbps, Low Channel - 6 dB Bandwidth

MultiView	Spectrum								
RefLevel	5.00 dBm	1 mm - 1 mm - 11	- RBW 100 k	Hz					1
1 Frequency	Sweep	108 µs (~25 ms)	# ARM 200 K	riz Mode Auto			Vi	N	= 1Pk Max
10 dBm								D3[1]	-6.05 dB
Concerno.	H1 10 100 dim			www.how	MANUMBER			141111	-6.26850 MHz
-20 dbm	H2-19 1	00 dBA	- Marty Marine	adeast. an	Contraction of the second seco	many work of		mil1]	#1008975 GHz
1.0 23 100				11 33	8		-		
-30 dBm	-		1			1		-	
		M	S			1	-		
-40 dBm	-	and a lot					MAN	A	
	we downsow	Privanin.					- WANNAWA	MMMARIN	
-SO dBri	MANYMAN			1					Mater
MMM	Sec. 0.2710								MAMAN
Nancau-							-		
-70 dbm									
-80 dBn		-		-			-		
-90 dBm	-				-				
-100 d8m	-	-						-	
CF 2.412 GH	z		10000 p	ts	4	5 MHz/		- 3	Span 45.0 MHz
2 Marker Ta	ble	2,2,2,2,2		- 	50	- 20 - St	42		Č.,
Type R	ef Trc 2.	X-Value 41008975 G	Hz -	13.10 dBm	1	Function	E	Function R	esult
D2 / M	u i 🔍	10.062 M	Hz	-5.92 dB					
D3 1	1 1	-0.2685 M	HZ	-6.05 68					26 00 2030
V	1						Measuring	Station 2	14:16:49

14:16:49 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 36 Mbps, Mid Channel – 6 dB Bandwidth

Type Ref	Trc 2.	X-Value 43793825 G 7.182 M	iHz IHz	V-Vake -12.80 dBm -5.67 dB	<u>i</u>	Function	Î	Function R	esult
F 2.437 GHz			1000	0 pts		1.5 MHz/		. 3	Span 45.0 MH
-100 d8m									-
-90 cBm									
B0 dBm					-	-			
70 dbn									
-to can			-		1				- MANANANAN
-40 dBm	WWWWWWW	MMMMW44					MAMMAN	MMMM	
-30 dBm		J	1		1	-	N		
20 dbm	H2 -18/96	0 dBr4	Jannah	MARAN MANAN	manum	MMWWWWWE		MI[1] 2	-12,80 dBr .43793625 GH
10 dBm					Ф			D3[1]	-6.10 d

14:18:34 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 36 Mbps, High Channel- 6 dB Bandwidth

MultiView	Spectrum								
Ref Level -5	00 dBm	160	· RBW 100	kH2 Islanda Auto I	ier.				194
1 Frequency S	weep	106 µs (725 ms)	• YDW 500	KHZ INDE AUDI				8	= 1Pk Max
10,000				112				D3[1]	-6.07 dB
	H1-12,770 dBm -				MANALAMAN		-		6.90750 MHz
-20 dbm	H2 -12.7	70 din	SAM ANY	Andadase and	1 CONTRACTOR OF	mannand		wit11	-12.77 08m
1000400				1	1				
-30 d8m			1			<u>k</u>		-	
000000		- MA	17. j				4		
-40 dBm		al st					N.L.	-	
	an anablydy	ANA CAMPA					LUWWIGWS	Walne	
-SO CBR	MANANA					-	0000 200	"TYYNBAL	DEA.
as man in the second								120	AND
PEO dan		-		-		-		-	all control of the
- 70 dbn	-			-				-	
-80 dBm		-			-				
-90 d8n							-	-	
- 320-10-10-10-10-10-10-10-10-10-10-10-10-10									
-100 d8m-									
CF 2.462 GHz			10000	pts	4	1.5 MHz/			ipan 45.0 MHz
2 Marker Tabl	e	1111111			<u> </u>		10		<u> </u>
MI Re	1 170	.4607513 GI	Hz	-12.77 dBm	12	Function	1	Function Re	suit
D2 M1	1	9.4095 MI	1Z	-6.20 dB					
D3 M1	1	-6.9075 MI	12	-6.07 68					
Ŭ	1						Measuring	annun 🖬	14:20:47

14:20:48 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 48 Mbps, Low Channel – 6 dB Bandwidth



14:23:56 26.09.2019



Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 48 Mbps, Mid Channel – 6 dB Bandwidth

14:25:36 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 48 Mbps, High Channel – 6 dB Bandwidth



14:27:09 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 54 Mbps, Low Channel - 6 dB Bandwidth



14:29:01 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 54 Mbps, Mid Channel – 6 dB Bandwidth



14:30:24 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 54 Mbps, High Channel – 6 dB Bandwidth



14:32:22 26.09.2019





18:10:13 26.09.2019



Modulation: 802.11n HT20 MCS0, Mid Channel – 6 dB Bandwidth

18:33:08 26.09.2019





18:38:34 26.09.2019



19:05:55 26:09:2019

CF 2.442 GHz

DI

Marker Table

Type | Ref | Trc |

141

X-Value .4429575 GHz -9.775 MHz 7.845 MHz

2

10000 pts

V-Value 6.81 dBm -5.90 dB -6.03 dB

5.0 MHz/

Function

Span 50.0 MHz

26.09.2019

19:05:55

Function Result

Measuring... (Sharatil)





19:51:14 26.09.2019





19:59:38 26.09.2019



20:11:04 26:09:2019

CF 2.442 GHz

DI

Marker Table

Type | Ref | Trc |

MI

X-Value 2.4404025 GHz -7.19 MHz 10.385 MHz

10000 pts

V-Value 7.63 dBm -5.78 dB -6.32 dB

5.0 MHz/

Function

Span 50.0 MHz

26.09.2019

20:11:04

Function Result

Measuring... (Sharatil)



20:22:32 26.09.2019

60.d

DI

CF 2.412 GHz

Marker Tabl

Type | Ref | Trc |

141

X-Value 2.412614 GHz -9.416 MHz 8.164 MHz

10000 pts

V-Value 7.63 dBm -6.04 dB -5.95 dB

4.0 MHz/

Function

Span 40.0 MHz

26.09.2019

20:22:32

Function Result

Measuring... (Sharatil)





20:31:50 26.09.2019





20:42:14 26.09.2019





20:53:42 26.09.2019







21:10:40 26.09.2019





21:43:52 26.09.2019







21:51:27 26.09.2019



22:03:28 26.09.2019





22:00:26 26.09.2019





22:09:21 26.09.2019







22:16:06 26.09.2019



22:27:26 26.09.2019





22:24:42 26.09.2019





22:39:28 26.09.2019







22:48:16 26.09.2019





22:59:57 26.09.2019




23:23:43 26.09.2019







23:36:08 26.09.2019





Non-Specific Radio Report Shell Rev. December 2017 Client: iRobot Corporation / Model: AXF-Y1



23:40:54 26.09.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 6 Mbps, Low Channel – Occupied Bandwidth



02:07:27 01.10.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 6 Mbps, Mid Channel - Occupied Bandwidth



Date: 25.SEP.2019 17:51:04

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 6 Mbps, High Channel– Occupied Bandwidth



Date: 25.SEP.2019 17:52:50



Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 9 Mbps, Low Channel - Occupied Bandwidth

02:10:28 01.10.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 9 Mbps, Mid Channel – Occupied Bandwidth



Date: 25.SEP.2019 18:02:39

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 9 Mbps, High Channel- Occupied Bandwidth



Date: 25.SEP.2019 18:01:24

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 12 Mbps, Low Channel – Occupied Bandwidth



02:12:41 01.10.2019

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 12 Mbps, Mid Channel - Occupied Bandwidth



Date: 25.SEP.2019 18:07:24

Modulation: OFDM 802.11g, Bandwidth: 20 MHz, 12 Mbps, High Channel– Occupied Bandwidth



Date: 25.SEP.2019 18:08:30